

Claims

- 5 1. A process for the production of a heat-treatable low emissivity coated glass that comprises the steps of
- 10 a) depositing an underlayer onto a glass substrate and
- 15 b) subsequently depositing a reflective metal layer by a vacuum deposition method, characterised in that the underlayer is deposited by a pyrolytic deposition process.
2. A process according to claim 1 wherein the reflective metal layer is deposited directly on the underlayer.
- 20 3. A process according to either claim 1 or claim 2 wherein the underlayer comprises a silicon oxide.
- 25 4. A process according to any one of claims 1-3 wherein the underlayer comprises a silicon oxide containing carbon.
- 30 5. A process according to any one of claims 1-4 wherein the pyrolytic deposition of the underlayer comprises contacting the glass substrate with a fluid mixture containing a silicon source, an oxygen source and a carbon source under conditions such that a silicon oxide layer, preferably containing carbon, is deposited.
6. A process according to claim 5 wherein the fluid mixture is a vapour mixture.

7. A process according to any one of claims 1-3 wherein the underlayer comprises silicon oxide containing nitrogen.

5 8. A process according to any one of the preceding claims wherein the underlayer is deposited on the glass substrate when the glass substrate is at a temperature in the range 450°C to 800°C.

10 9. A process according to claim 8 wherein the underlayer is deposited on the glass substrate when the glass substrate is at a temperature in the range 600°C to 780°C.

15 10. A process according to any one of preceding claims wherein the underlayer is deposited on to a glass ribbon during the float glass production process at substantially atmospheric pressure.

20 11. A process according to claim 10 wherein the glass ribbon is cut into sheets after deposition of the underlayer.

25 12. A process according to any one of the preceding claims wherein the reflective metal layer comprises silver or aluminium.

30 13. A process according to any one of the preceding claims wherein an anti-reflection layer is deposited by a vacuum deposition process on to the coated glass after deposition of the reflective metal layer.

14. A process according to claim 13 wherein the anti-reflection layer comprises a metal oxide.

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15. A process according to claim 14 wherein the anti-reflection layer comprises zinc oxide or tin oxide.

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16. A process according to any one of claims 13-15 wherein a second reflective metal layer and a second anti-reflection layer are sequentially deposited by a vacuum deposition process after deposition of the first anti-reflection layer.

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17. A process according to any one of the preceding claims additionally comprising a heat treatment step wherein the heat-treatable low emissivity coated glass is subjected to a temperature in the range 400 to 750°C in an oxidising atmosphere.

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18. A process according to claim 17 wherein the heat treatment step is directed to the production of bent and/or toughened coated glass.

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19. A process according to either claim 17 or claim 18 wherein the visible transmission of the coated glass is increased by the heat-treatment step.

20. A coated glass produced by a process according to any one of the preceding claims.

21. A heat-treatable low emissivity coated glass comprising a glass substrate having a multilayer coating on one surface, said multilayer coating comprising a pyrolytically deposited underlayer, a vacuum deposited reflective metal layer and a vacuum deposited anti-reflection layer.
22. A coated glass according to claim 21 wherein the underlayer comprises a silicon oxide.
23. A coated glass according to claim 22 wherein the underlayer comprises a silicon oxide containing carbon.
24. A coated glass according to any one of claims 21-23 wherein the underlayer has a refractive index in the range 1.5 to 3.
25. A coated glass according to any one of claims 21-24 wherein the underlayer has a thickness in the range 30 to 100 nm.
26. A coated glass according to any one of claims 21-25 wherein the reflective metal layer has a thickness in the range 5 to 30 nm.
27. A coated glass according to claim 26 wherein the reflective metal layer has a thickness in the range 7 to 18 nm.

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28. A coated glass according to any one of claims 21-27 wherein the anti-reflection layer has a thickness in the range 30 nm to 90 nm.

29. A coated glass according to any one of claims 21-28 wherein the coated glass has a normal emissivity of below 0.2.

30. A coated glass according to any one of claims 21-29 wherein the coated glass has a normal emissivity of below 0.1.

31. A coated glass according to any one of claims 21-30 wherein the coated glass has been heat treated by heating it to a temperature in the range 400 to 700°C in an oxidising atmosphere.

32. A coated glass according to claim 31 wherein the coated glass has a normal emissivity of below 0.2 after the heat treatment step.

33. A coated glass according to claim 32 wherein the coated glass has a normal emissivity of below 0.1 after the heat treatment step.

34. A heat-treatable low emissivity coated glass comprising a glass substrate having a multilayer coating on one surface, said multilayer coating comprising an oxygen scavenging underlayer, a vacuum deposited reflective metal layer and a vacuum deposited anti-reflection layer.

35. A multiple glazing unit comprising a first glazing pane of a coated glass according to claim 34 and a second glazing pane.

5 36. Laminated glass comprising a first glazing pane of a coated glass according to claim 34, an interlayer and a second glazing pane.

10 ~~37. A process for producing coated glass substantially as herein described with particular reference to the Examples 1-4.~~

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